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ABSTRACT

Thirty-five studies were originally selected to be analyzed as to behavior modification techniques used in successful weight-loss programs. From these, 14 studies were chosen that provided sufficient data, including follow-up data, and 4 studies that had no follow-up data but that did report data from the treatment time period. As a result of rank ordering the studies from high to low, based on the total average amount of weight loss attained during the entire study (treatment plus follow-up), two groups were formed; the more successful and the least successful weight-loss programs. The findings showed that self-monitoring, stimulus control, and cognitive restructuring were used by the least and most successful programs, but only behavioral contracting, positive reinforcement, and chaining were utilized in the more successful weight-loss programs. Other noteworthy findings included the difference in average follow-up weeks between the least successful (53 weeks) and most successful programs (27 weeks), difference in average weight loss during treatment for the least successful (15.9 lbs.) programs compared to the more successful programs (13.3 lbs.), and the difference and comparison of average weight loss, at the end of the follow-up between the least successful programs (14.9) and the more successful programs (10.9 lbs.). A three-page list of references and tables of data conclude the document. (Author)

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A REVIEW AND ANALYSIS OF BEHAVIOR MODIFICATION TECHNIQUES USED IN SUCCESSFUL WEIGHT LOSS PROGRAMS

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ABSTRACT

Thirty-five studies were originally selected to be analyzed as to behavior modification techniques used in successful weight loss programs. As a result of rank ordering the studies from high to low based on the total average amount of weight loss attained during the entire study (treatment plus follow-up), two groups were formed; the more successful weight loss programs and the least successful weight loss programs. The findings showed that self-monitoring, stimulus control, and cognitive restructuring were used by the least and most successful programs, but only behavioral contracting, positive reinforcement, and chaining were utilized in the more successful weight loss programs. Other noteworthy findings included the difference in average follow-up weeks between the least successful (53 weeks) and most successful programs (27 weeks), difference in average weight loss during treatment for the least successful (15.9 lbs.) programs compared to the more successful programs (13.3 lbs.), and the difference and comparison of average weight loss, at the end of follow-up between the least successful programs (14.9 lbs.) and the more successful programs (10.9 lbs.).

INTRODUCTION

As a result of the overwhelming amount of attention being given to walking around in a slender body for the good of one's physical health as well as one's mental health, the professional literature has been replete with reports of weight loss programs trying to respond to this need. Not only do the reported studies span several professional areas, but include the use of a variety of approaches in hopes of discovering the best method for losing weight for the targeted population.

In 1981, Foryet et. al. (1981) did an analytical review of over 200 articles describing behavior modification programs for weight reduction. As a result of his findings, Foryet concluded that although weight reduction does occur, the actual weight loss is quite small, "the variability among patients is large, and further weight losses do not occur following the end of formal treatment."

This study is a modification of the Foryet study, but involving a review of fewer weight loss programs, and concentrating the analysis on the average amount of weight lost over the average length of the program, combined with identifying the behavior modification techniques used in the more successful programs.

PURPOSE

The purpose of this study was to review previously conducted weight loss studies with the intent of identifying the setting and the behavior modification techniques used in the more successful programs conducted with otherwise healthy persons, and comparing this data with the average amount of weight loss which occurred during the designated time span of each program. Therefore, those

studies whose subjects were in a hospital setting (receiving either physical or mental medical care) were eliminated, as were those studies in which subjects were using prescribed drugs in addition to behavior modification techniques.

METHOD

A Medline and Colleague computer search was conducted to identify those studies which fit the descriptors "weight loss" and "behavior modification." Thirty-five studies were orginially selected to be evaluated, but upon closer reading, the author determined that ten of the 35 reported studies either did not provide sufficient data to be of benefit, were not actually studies but instead discussions of weight loss and behavior modification techniques, or were summary reports of a combination of weight loss programs. The next step was to classify the studies according to the criteria of "Follow-Up" and "No Follow-Up," which resulted in still more eliminations due to some studies not reporting this data, and/or specific treatment times in regard to this aspect of the program being absent. The final tally was 14 studies which reported follow-up data, and four studies which had no follow-up, but did report data from the treatment time period, a scoresheet was designed to record data from each of the remaining studies, and then descriptive statistics were used to analyze the results.

FINDINGS

A frequent problem with weight loss programs is the number of people who drop out of the program before completion, due to any number of reasons. Eleven of the 14 "Follow-Up" studies reported attrition data, with the average being 27.8%., the median 21.7%, and ranging from as little as 5%. to as much as 62.5%. The "No Follow-Up" group (14 studies reported this data) averaged 24.7% attrition, with the range form 13% to 50%.

The average weight loss per week for the most successful treatment program at the completion of the follow-up was .51 pounds, with the average follow-up program producing .14 pounds lost. The average weight loss ranged from .51 pounds lost to .23 pounds gained. In comparison, the most successful "No Follow-Up" program posted an average of 1.3 pounds lost over a ten-week treatment period. Quite obviously, this finding must be tempered by the assumption that if a follow-up had occurred (50 weeks being the average follow-up reported by studies who incorporated this factor), the average weight loss would be much less.

Comparison of average treatment weight loss (time spent in the actual treatment period, where instruction was given and/or groups met to discuss mutual problems) regardless of whether or not follow-up occurred, ranged from an average low of .09 pounds lost to a high of an average 4.3 pound loss. When evaluating the combined weight loss for both the "Follow-Up" and "No Follow-Up" treatment period (which averaged 12.1 weeks) the average weight loss was 1.2 pounds. It is interesting to note that the study with the longest treatment (25 weeks) had the poorest weight loss average of the 18 studies that were analyzed. Reasons for this low average weight loss may be due to the fact that the target population was a small group (5) of severely obese teenage females that met for 90 minutes per week, and reported utilizing only two behavior modification techniques; self-monitoring and self-reward.

When analyzing the data from the "Follow-Up" group, the average weight loss for just the follow-up time period was 3.96 pounds, with a range from a weight gain of 11.8 pounds to a weight loss of 20.3 pounds. As mentioned above, the average follow-up time was 50 weeks, ranging from as short as 8 weeks after treatment to as long as 84 weeks (5 years) before assessing the effects of the treatment program.

Nine of the 14 "Follow-Up" programs had an exercise component as a part of the regimen, with the exercise factor being a part of the four more successful programs, present in only one of the middle six programs, and present again in the four least successful weight loss programs.

In comparing the top four more successful follow-up weight loss programs with the four least successful weight loss programs, Table I reflects some interesting differences.

INSERT TABLE I HERE

The more successful weight loss programs had an average follow-up period of 27 weeks compared with the least successful groups' average of 53 weeks. This particular fact may be the most discriminating issue of all the aspects that this study analyzed. When comparing the differences in all other categories between the two groups, none appeared to be as divergent as the time allotted to follow-up, with the exception of the attrition rate. The more successful weight loss groups averaged 89 subjects with an attrition of 14.7%. The least successful weight reduction groups had an average of 110 subjects and an attrition of 47.3%.

Two of the more successful weight loss programs were conducted in community settings, with the remaining two programs taking place in weight control clinics. And, in one of the weight control clinics, the individuals were housed at the facility for the full four weeks of treatment, while being restricted to a 700 kcal. diet, and participating in directed physical activities. In comparison, two of the four least successful weight loss programs were held in a community setting, with the third being conducted at the worksite, and the fourth sponsored by a hospital outpatient program.

TABLE II lists the bahavior modification techniques that each of the more successful and least successful weight loss programs reported.

Insert Table II Here

Three behavior modification techniques were not reported as utilized by the four least successful programs, behavioral contracting, positive reinforcement, and chaining, but were used in the four more successful studies.

The age and sex of subjects also indicates a commonality between the two sets of four studies as is shown in TABLE III. The majority of subjects in both groupings are female, (84% for the more successful weight loss group, and 75% for the least successful weight loss group) with the average age being the same for both groups; 42.4 years.

Insert Table III Here

DISCUSSION

When looking for possible reasons to explain the differences between the more successful and least successful weight loss programs, several factors may be discussed. However, the one factor which the author believes to be most discriminating was the follow-up time period. The least successful weight loss groups' average follow-up time is almost double that of the more successful studies: an average of 53 weeks compared to an average of 27 weeks of follow-up.

As a result of following a group of subjects for approximately one year, one would assume the attrition rate to be higher, and the average weight loss to be lower than for subjects followed for approximately six months. This assumption is born out by comparing the two groupings at the end of their treatment phases of the program.

An average of four weeks of treatment separated the more successful from the least successful weight loss programs (8 weeks vs. 12.8 weeks). More revealing is the average treatment weight loss, 13.3 pounds for the more successful programs, and 15.9 pounds for the least successful weight loss programs. So, at the end of the treatment period, the least successful programs actually had an average weight loss greater than the more successful weight loss programs. Obviously, the ability to maintain this weight loss over a lengthy follow-up time period (53 weeks compared to 27 weeks) was impossible. At the end of follow-up, the more successful weight loss group averaged 10.9 pounds lost, while the least successful group actually had a gain of 4.9 pounds. And, when the weight loss is averaged per week for the entire length of the study (treatment plus follow-up weeks), the difference is not as great: .43 lost per week for the more successful group, compared with a gain of .10 pounds per week for the least successful programs. As stated above, the length of follow-up time, in the opinion of the author, accounts for the major differences between the groups.

Self-monitoring/observation, stimulus control, and cognitive restructuring/modification are behavioral change techniques that were reported used by both the more successful and least successful weight reduction programs.

However, only the more successful weight loss programs reported using behavioral contracting, positive reinforcement, and chaining (two or more behaviors that occur in a definite order within a behavioral sequence). Finally, the more successful weight loss programs reported using 10 different behavior change techniques as compared with 7 different techniques being reported as used by the least successful weight loss studies.

CONCLUSIONS

The findings of this study are congruent with Foreyt's findings in 1981. Specifically, weight loss does seem to occur, but whether or not it is of a significant nature is of little consequence, since that loss is not maintained over time. The setting for the weight loss also does not seem to make a difference. Even subjects in intensive weight loss clinics are not able to maintain weight loss over time. One possible solution to this dilemma may be in prevention rather than treatment. Since the loss of excess weight does not seem to be maintained over time for middle-aged females, perhaps education efforts early in life focusing on nutrition, exercise, and behavior management may be the answer.

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TABLE I

Comparing The Averages of the Top four More Successful Follow-Up Weight Loss Programs With the Four Least Successful Follow-Up Weight Loss Programs

Factors	Four More Successful Groups	Four Least Successful Groups
Treatment Length	8 weeks	12.8 weeks
Treatment Av. Wt Loss	13.3 Lbs	15.9 Lbs
Follow-Up Length	27 weeks	53 weeks
Follow-Up Av. Weight Loss	10.9 Lbs	-4.9 Lbs
Weight Loss Av. Per Week	.43 Lbs	-0.10
Av N/ Attr Percent	89/14.7%	110/47.3%
Av Number Of Behav. Modif. Techniques Used	4.8	3.3
Program Settings	2 Community 2 Weight Clinics	2 Community 1 Worksite 1 Hosp. Outpatient
Exercise Included	4	4

TABLE II

Specific Behavior Modification Techniques Used By The Four More Successful and the Four Least Successful Follow-Up Weight Reduction Programs

Behavior Modification Techniques	More Successful	Least Successful
Self Monitoring/ Self Observation	3	4
Stimulus Control	4	3
Cognitive Restructuring/ Cognitive Modification	3	2
Behavioral Contracting	2	
Self Reinforcement	2	1
Environment/Situational Management	1	1
Cognitive Management	1	1
Self Reward/Motivation	1	1
Positive Reinforcement	1	
Chaining	1	

TABLE III

Sex And Age Of Subjects In The Four More Successful And The Four Least Successful Follow-Up Weight Loss Programs

Four More Successful Groups	Male	Female	Average Age
Chapman (1978)	0	57	37.8
Brownell (1978)	10	19	Not Given
Miller (1981)	14	48	44.7
Brownell (1979)	26	121	44.8
Averages =	12.5	61.3	42.4

84% Of Subjects Were Female

Four Least Successful Groups	Male	Female	Age
Holm (1983)	0	160	42.4
Perri (1984)	11	45	Range 21-60
Abrams (1983)	11	122	Range 20-60
Jeffrey (1983)	89	0	Not Given
Averages =	27.8	81.8	42.4

75% Of Subjects Were Female